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Relationship between accumulated degrees of frost and monthly mean minima (inland stations)

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Monthly records for East Malling 1951 - 1967 were examined to extract the monthly accumulated degrees of frost. (The sum of the positive differences of (32-T) where T = night minimum temperature.)

The results were:-

Month	Correlation	Regression Equation
October	-0.65	63 - 1.4T
November	-0.85	275 - 6.6T
December	-0.91	506 - 12.9T
January	-0.94	693 - 18.8T
February	-0.92	545 - 14.6T
March	-0.88	416 - 10.6T
Nov - March	-0.90	493 - 12.7T

There is a very high correlation between the slope of the regression lines and the intercepts.

If the mean values of monthly totals of accumulated frost are found for each $1^{\circ}F$ range of monthly minima, (smoothed by overlapping triplets), the correlation between the frost factor and log T is -0.98, with the equation

$$1636 - 1027 \log T$$

with October values omitted.

This result was checked against the 1939 - 1950 values for Bodiam

Mean monthly minimum	Accumulated Frost Degrees	
	E Malling	Bodiam
23.8		256
24.5	225	
26.2	189	
27.2		161
28.2		148
29.5	121	
29.6		119
30.8		109
30.9	105	
31.6	88	90
32.6	71	
32.8		70
33.6	52	
33.7		56
34.4		51
34.6	44	
35.5	38	43

Mean monthly minimum	Accumulated Frost Degrees	
	E Malling	Bodiam
36.4	30	37
37.2		31
37.3	21	
38.1		24
38.4	14	
39.3		15
39.5	11	
40.2	8	
40.7		11

There is no significant difference between these two distributions and the estimates from the E Malling formula have a 0.98 correlation with the Bodiam actuals. The worst errors are in the very high and very low values.

Any comments or suggestions on this paper should be referred to the author.

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